



An Energy Efficiency Workshop & Exposition

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Kansas City, Missouri

***Proactive Approach to  
Deregulation:  
Integrated Energy Management  
In The Federal Government***



# ***Volatile Energy Prices Are Causing Major Problems For Federal Managers and Corporate CFO's***

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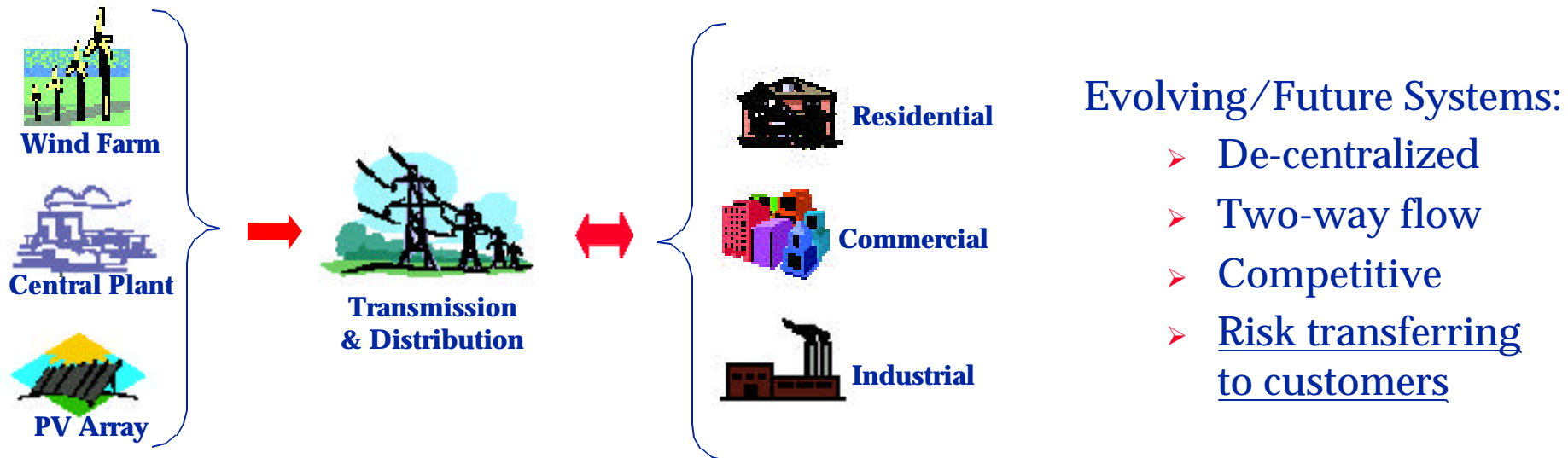
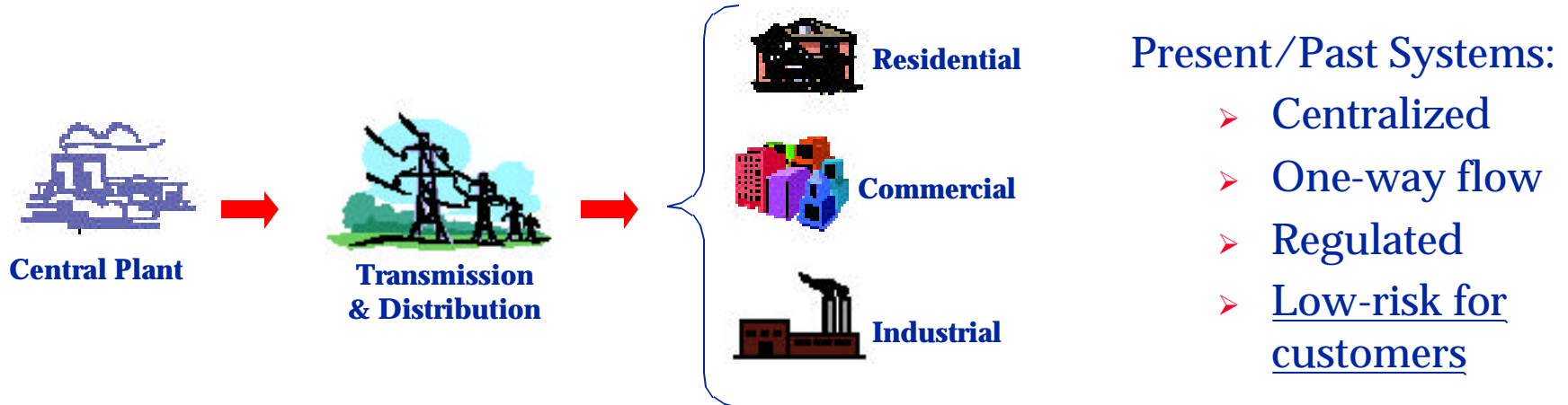
## o **Federal Headlines**

- *DoD News Briefing 5/4/01 -*  
“...DoD to reduce peak demand by 10% this summer...15% by next summer...”
- *Star-Tribune Newspaper of the Twin Cities Minneapolis-St. Paul 5/3/01*  
- “The measures require managers of the government’s 500,000 buildings to draw up plans...to reduce their energy...”
- *San Diego Union Tribune 5/6/01 -*  
“Vice President, Dick Cheney, said the nation would need at least 1,300 new power plants by 2020”

## o **Commercial Headlines** - (source: [www.the street.com](http://www.the street.com))

- “Georgia-Pacific Badly Misses Expectations...Energy”
- “International Paper Sees First Quartile Shortfall...Energy”
- “ConAgra says High Energy Costs to Hurt Rest of Fiscal Year”

# Changing Power Delivery System





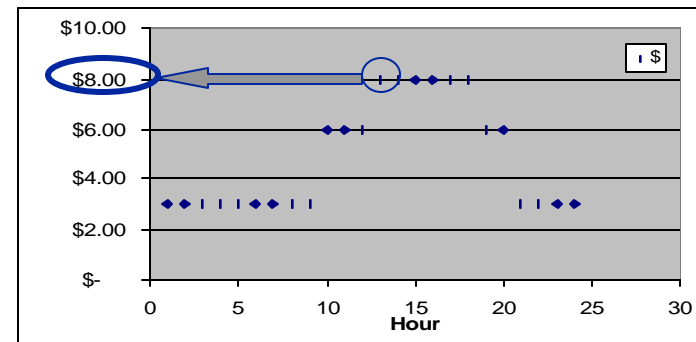
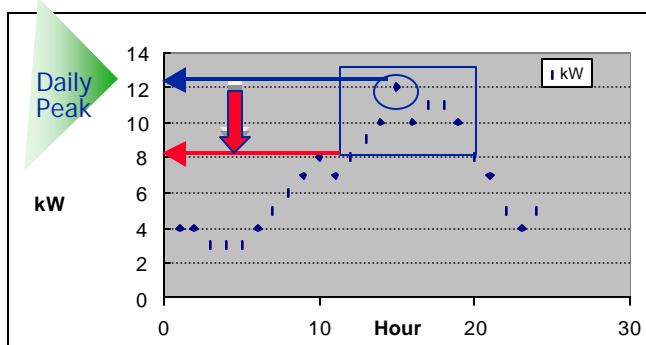
# Opportunities in Transitioning Energy Market

- Procure lower cost energy
- Invest in cost effective energy efficiency
- Optimize interaction

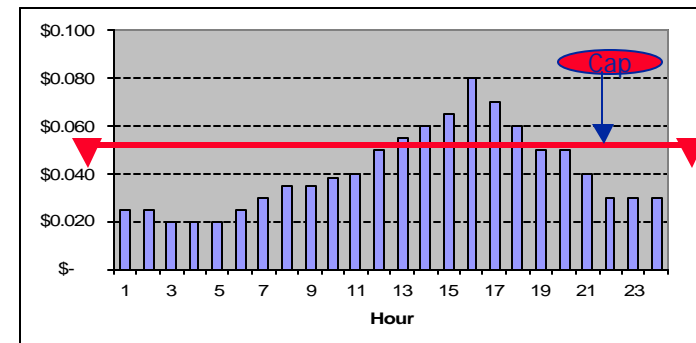
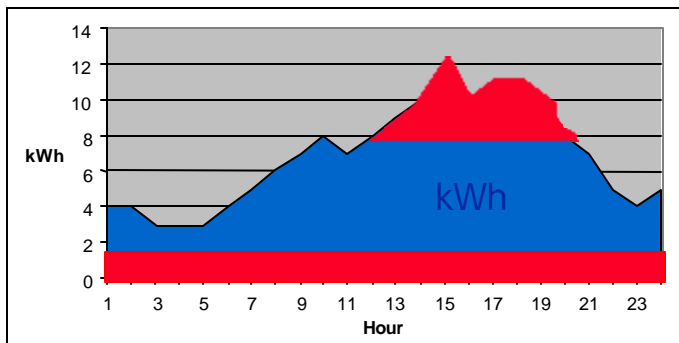
## Energy Units

## Cost Units (Rates)

CAPACITY



CONSUMPTION





# ***Energy Management Success is Proportional to Information***

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***Morgan Stanley Dean Witter***

***March 10, 2000***

## **“Global Electricity - A Shift in The Balance of Power”**

- “This (meaning the network/real-time information age) is causing one of the most fundamental and powerful shifts in our society - with some of the greatest implications for energy. A shift in power from the producer to the consumer.”
- “Just so will freely accessible information on energy availability and price transparency transform the energy industry.”
- “When power shifts from producers to consumers, it shifts the balance of pricing power.”
- “The shift from producer to consumer means a shift from supply focus to a demand response.”
- **“He with the most information wins.”**



## ***Industry Best Practices***

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1. Commitment by top-level management
2. Clearly defined goals
3. Communication of goals throughout all levels within company
4. Assignment of responsibility and accountability at the proper levels
5. Formulation of, and tracking of, energy metrics
6. Identification of all potential projects on continuous basis
7. Adoption of project investment criteria reflecting risks and return
8. Provision of recognition and reward for achieving the goals

# ***Federal Government Case Study: Fort Bragg***

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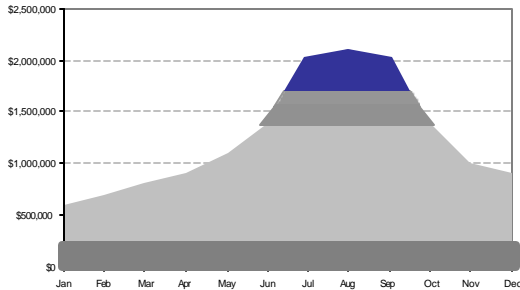
## **Fort Bragg 1998 Baseline:**

- 7,500 buildings with ~ 30,000 sq/ft
- \$36,000,000 annual utility spend
- Severe O&M budget reductions, up to 20% / year, impacted their ability to repair/replace equipment or perform preventative maintenance
- Deterioration of facilities was accelerating
- 5 meters = uncontrolled consumption of resources



# Integrated Energy Management Targets

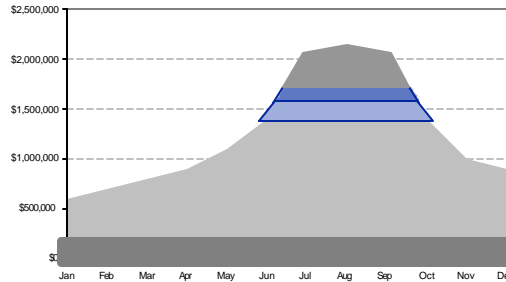
## Supply



- Electrical rate change
- Natural gas rate change
- Metering infrastructure



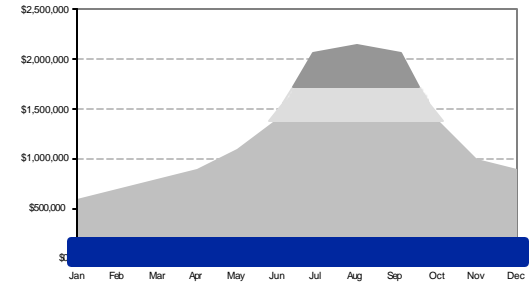
## Optimization



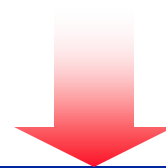
- Back-up generators
- Propane air plant
- Combined heating and cooling
- Multi-fuel central plants



## Demand



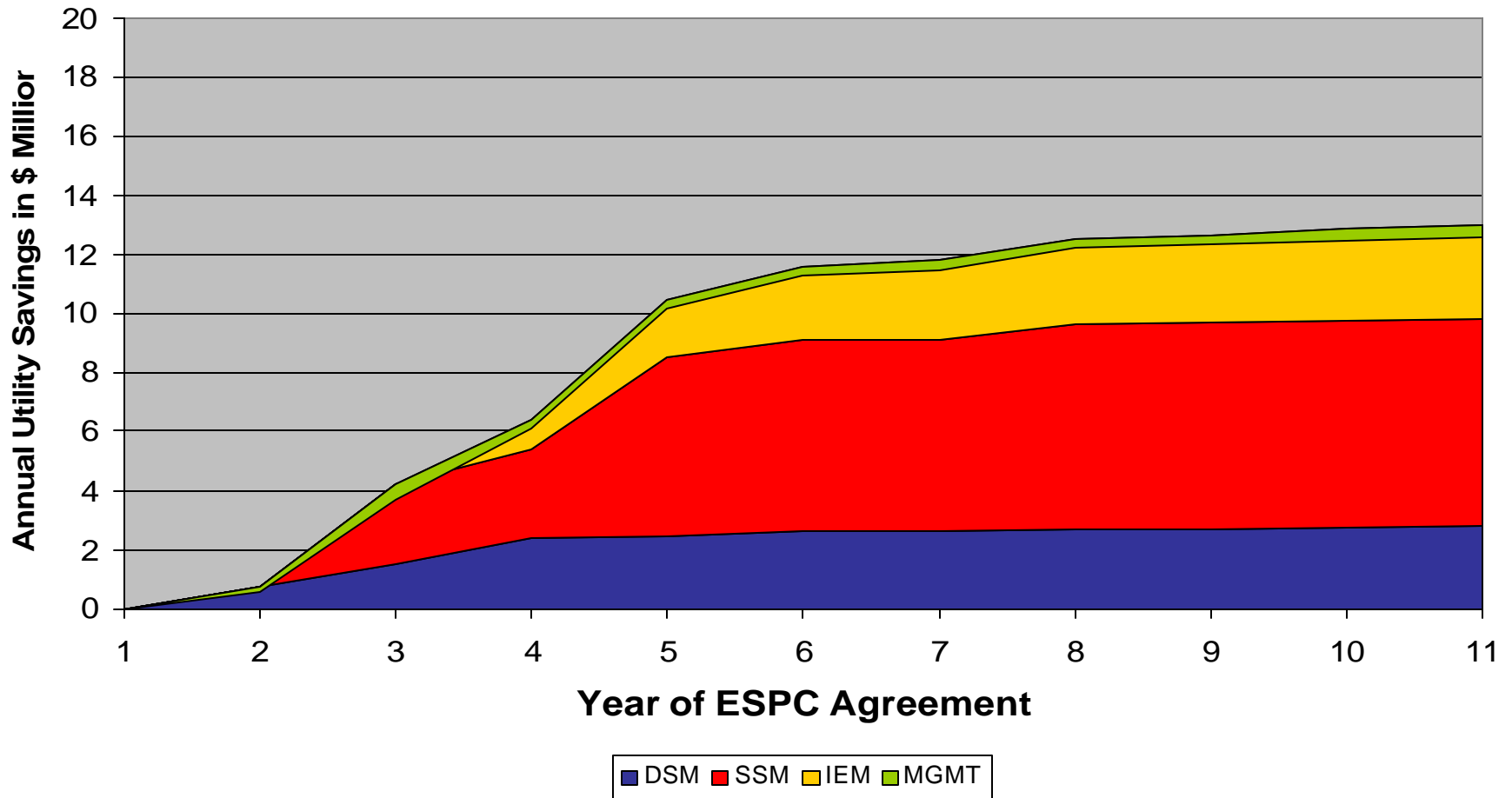
- Lighting improvements
- Control improvements
- HVAC improvements
- Motor improvements
- Equipment fuel conversions



## Robust Energy Information System



## Savings Potential





# Energy Information System: Vision

## Energy Information System (EIS)

- Web Access
- Data Mining
- Benchmarking

### Utility Tracker

- Bill Consolidation
- Rate Analysis
- Bill Error Resolution
- Invoice Audit
- Trend Analysis
- Savings Recommendations
- Reporting/Charting
- Bill Payment\*

### Energy Manager

- Interval Data Collection
- Data Mining Analysis
- Savings Recommendations
- Charting/Graphing
- Load Aggregation
- Load Monitoring
- Measurement & Verification
- Power Quality/Factor Tracking
- Submetering\*
- Tenant Billing\*
- Event Notification\*

### Load Manager

- Curtailment Strategies
- Distributed Generation Interface
- Load Shedding
- Load Forecasting
- Building Consumption Modeling
- Dual Fuel Alternatives
- RTP Interface\*

### Equipment Manager

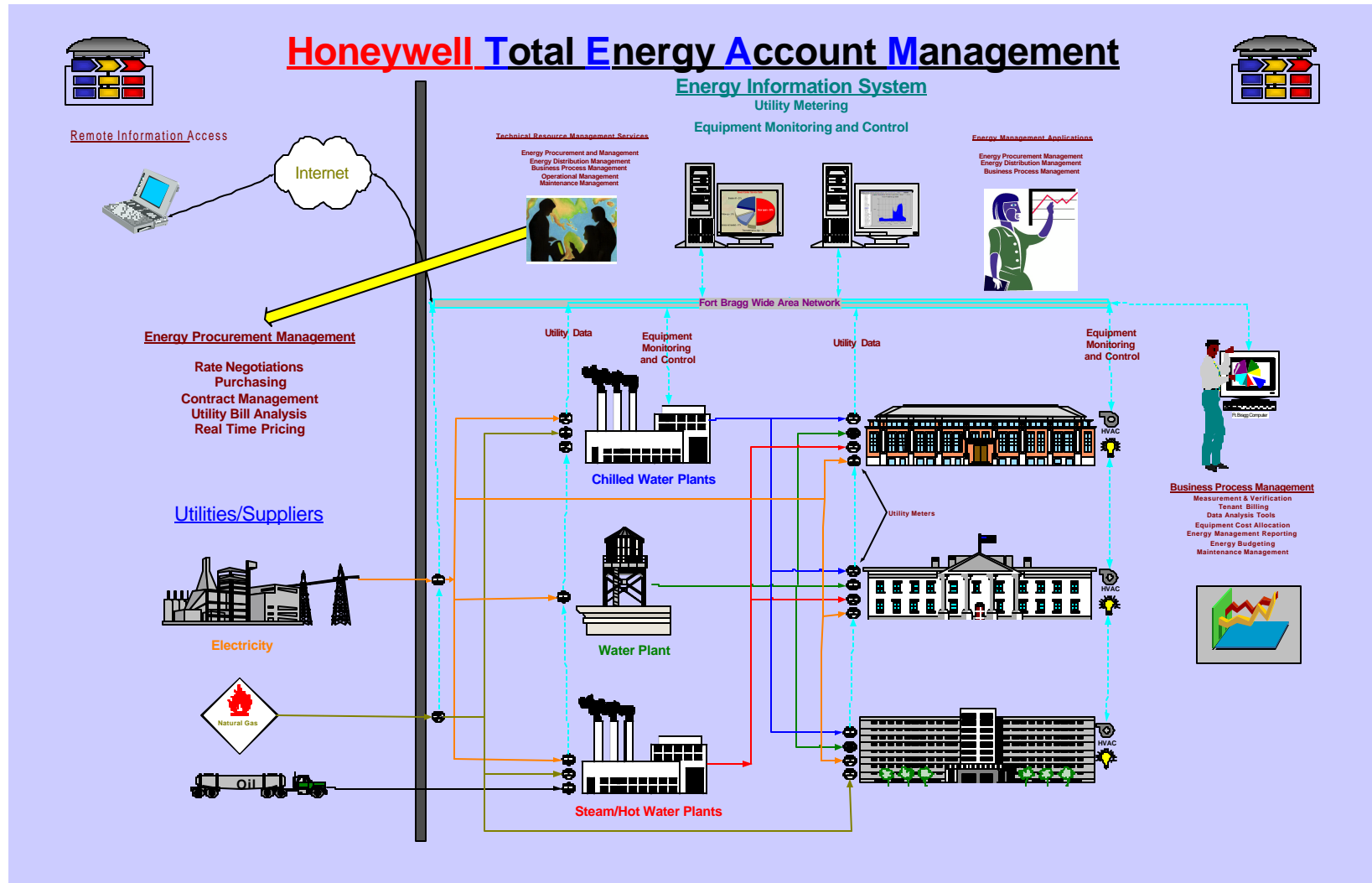
- Remote, Supervisory Monitoring & Control
- Alarm/Event Notification or Segregation
- Alarm Monitoring
- Manage Operating Schedules or Equipment Optimization
- 2-Way Communication
- Load Management\*

### Vendor Manager

- Alarm Management
- Remote Diagnostics
- Service Call Tracking
- Consolidated Service Dispatch
- Tracking & Ranking Vendor Performance
- Global Service Response Center (GSRC)
- Track "In-Warranty" Manufacturer Repairs\*

\*Optional Services

# Energy Information System Architecture



# EIS: Fort Bragg Plot

Microsoft Internet Explorer window titled "Niagara Demo Page - Microsoft Internet Explorer". The address bar shows <http://158.5.17.150:87/stations/FtBraggWS/Web/BraggSiteTree.html>.

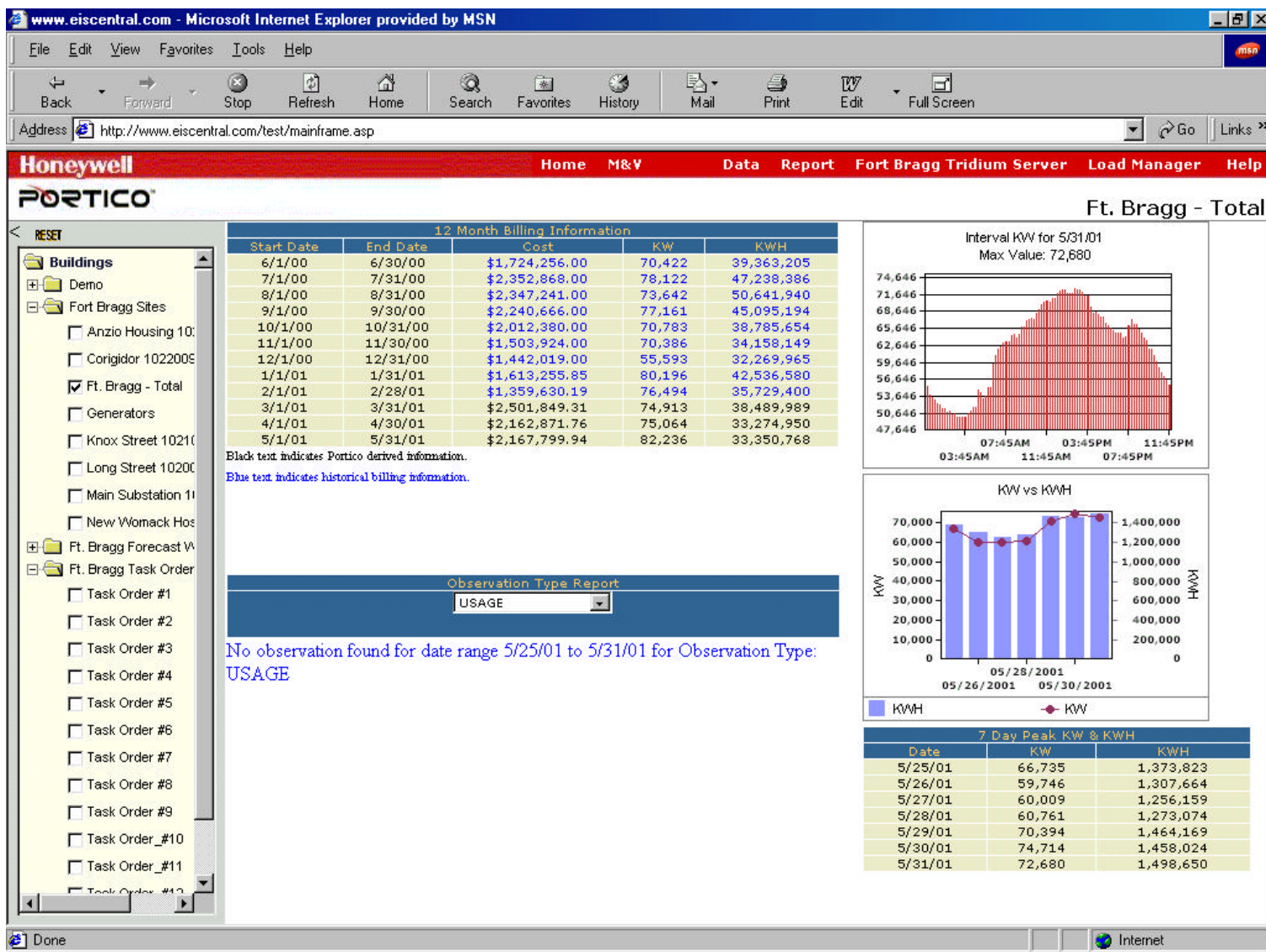
The main content area displays a map of Fort Bragg, NC, titled "Fort Bragg, NC" with the subtitle "Welcome to Honeywell - Fort Bragg, NC - Home of". The map is divided into numerous labeled areas, including AREA V, AREA D, AREA W, AREA R, AREA 9, AREA 3, AREA 2, AREA 8, AREA A, AREA 7, AREA N, AREA 1, AREA 6, AREA M, AREA B, AREA 4, AREA 5, AREA C, AREA H, AREA I, AREA F, AREA D, AREA E, AREA G, AREA J, AREA Y, and AREA P. The map also shows POPE AFB.

A sidebar on the left features the "AIRBORNE" logo and a tree view for "FORT BRAGG" with the following items:

- Totals
- Bragg Buildings
- Generators
- Non-Bragg Areas
- Plants
- Plant Operations
- Tenant Billing

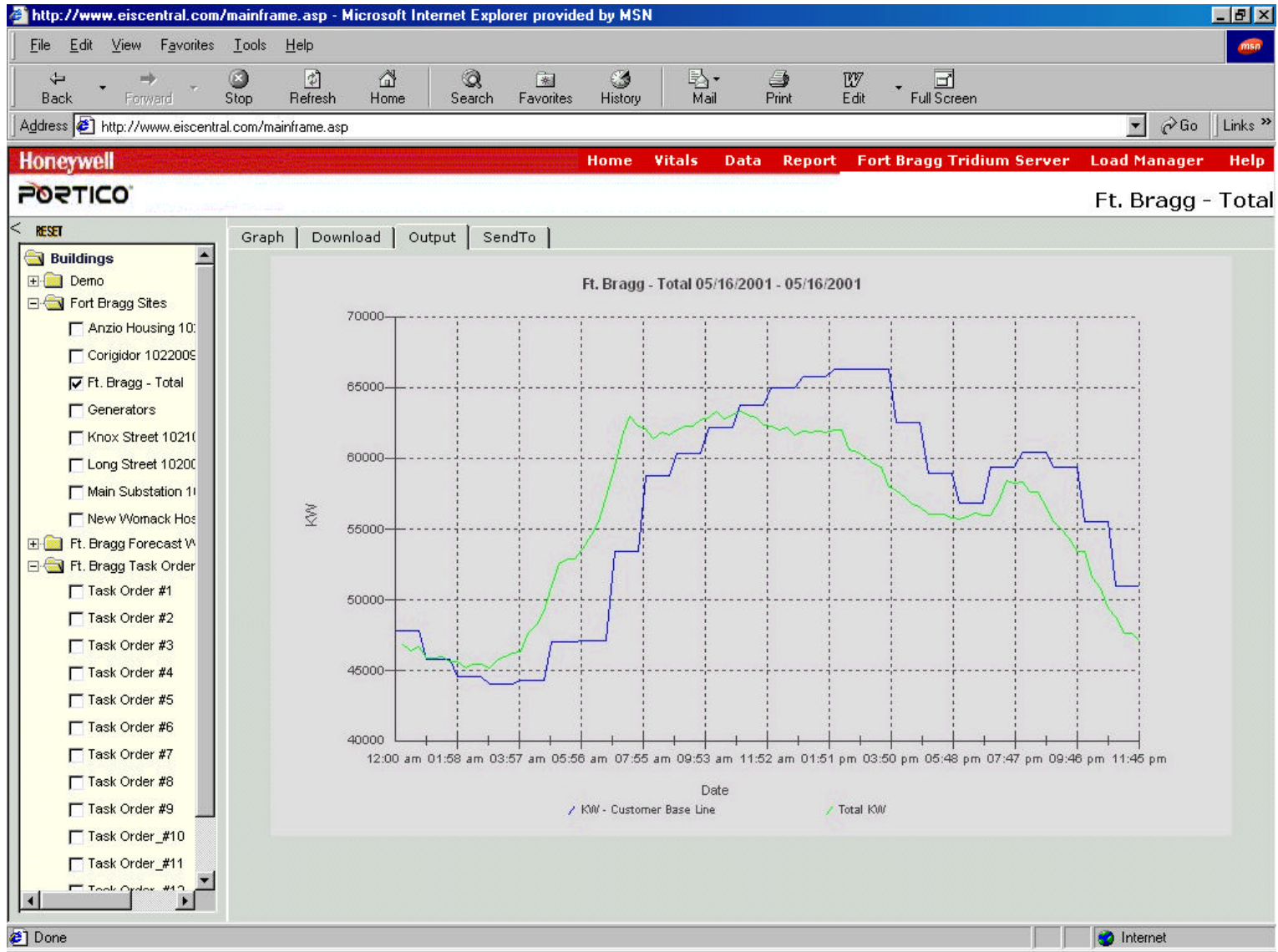
The status bar at the bottom indicates the page is "Powered by Niagara" and shows the system clock as 1:14 PM.

# EIS: Summary Snapshots

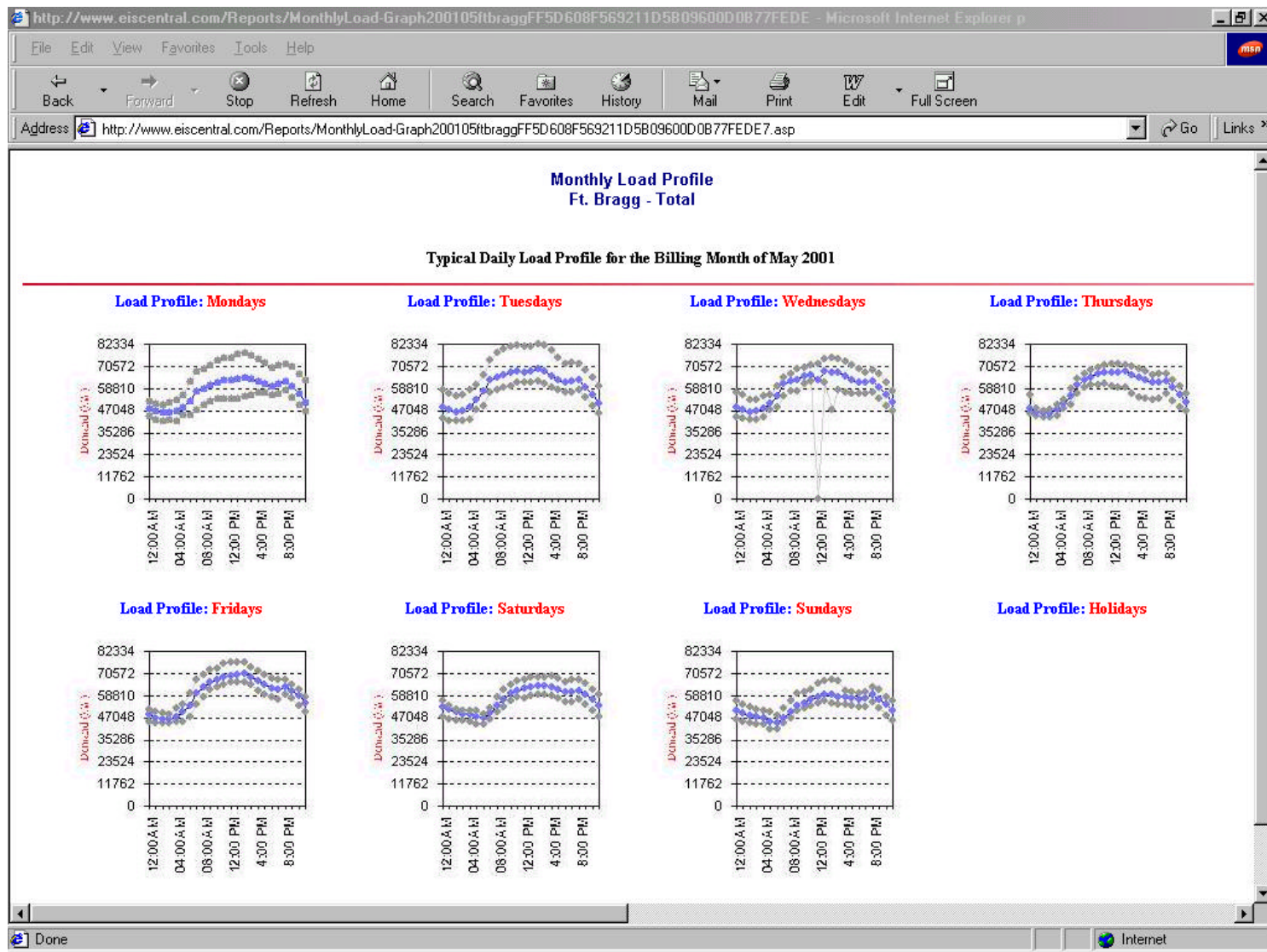




# EIS: Daily Load Profile

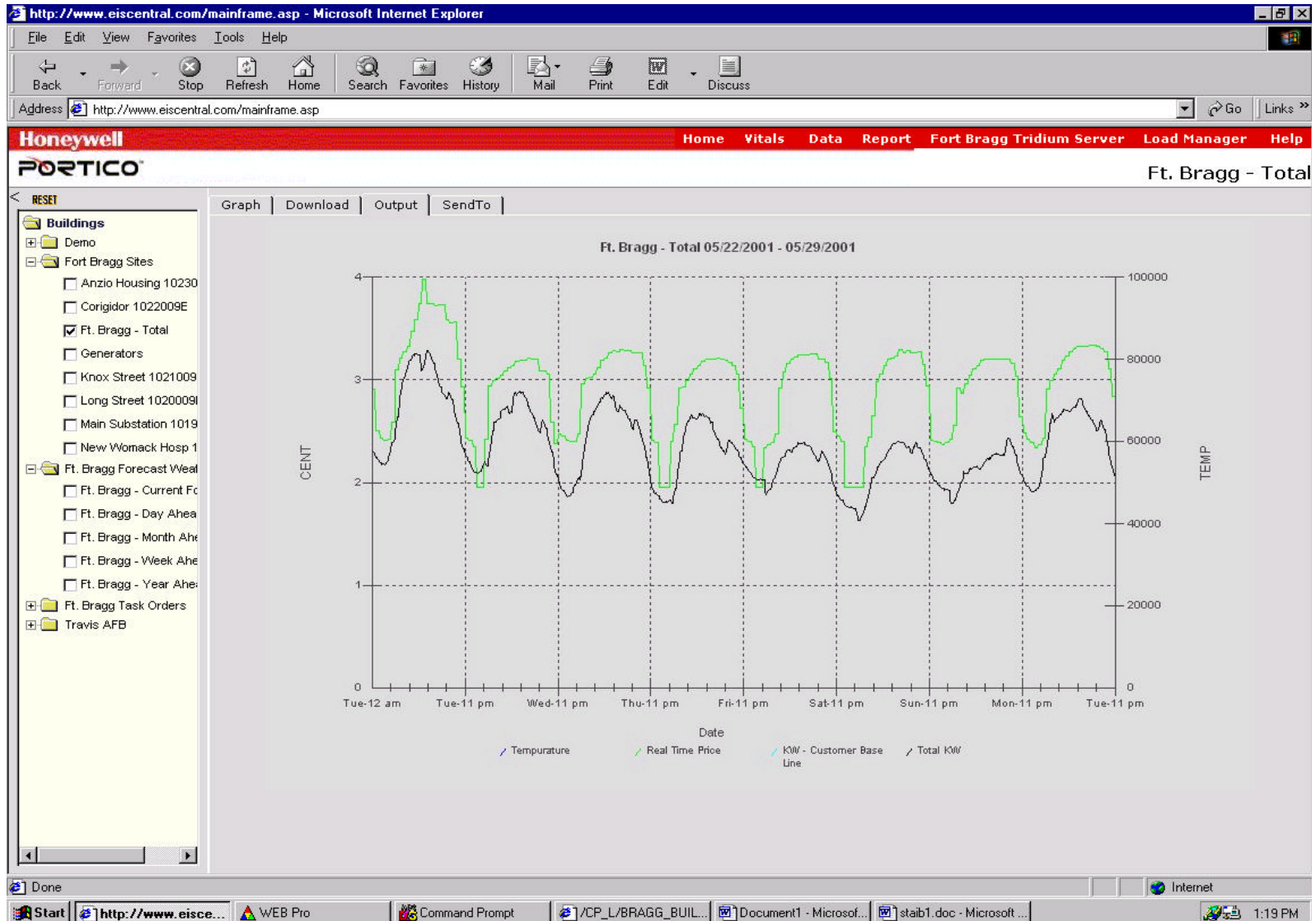


# EIS: Monthly Load Profile





# EIS: Load Management Target






# EIS: Load Management Summary

**Niagara Demo Page - Microsoft Internet Explorer**

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss

Address <http://158.5.17.150:87/stations/FtBraggWS/Web/BraggSiteTree.html> Go Links



**FORT BRAGG**

- Totals
- Bragg Buildings
- Generators
  - Generator 1945
  - Generator 1947
  - Generator 2144
  - Generator 2245
  - Generator 2245A
  - Generator 2245B
  - Generator 2448
  - Generator 2744
  - Generator 3045
  - Generator 3055
  - Generator 3242
- Non-Bragg Areas
- Plants
- Plant Operations
- Tenant Billing

## Generator Summary

Demand Start Level **100.00 MW**  
Demand Stop Level **99.50 MW**

JSOC	COMM	PRIORITY	BREAKER	AVAILABILITY	OUTPUT	TOTAL KWH	RUNTIME
1945 Gen (180 kW)	Ok	10	Open	Unavailable	0.00 kW	9339.36 kwh	59.9 hrs
1947 Gen (240 kW)	Ok	9	Open	Unavailable	0.00 kW	11867.76 kwh	58.8 hrs
2144 Gen (315 kW)	Ok	5	Open	Unavailable	0.00 kW	8400.00 kwh	38.2 hrs
2245 Gen (330 kW)	Ok	4	Open	Unavailable	0.00 kW	9856.08 kwh	45.8 hrs
2245A Gen (235 kW)	Ok	1	Open	Unavailable	0.00 kW	5131.52 kwh	34.7 hrs
2245B Gen (600 kW)	Ok	6	Open	Unavailable	0.00 kW	21589.00 kwh	51.4 hrs
2448 Gen (240 kW)	Ok	3	Open	Unavailable	0.00 kW	8911.20 kwh	45.8 hrs
2744 Gen (400 kW)	Ok	7	Open	Unavailable	0.00 kW	12465.38 kwh	45.6 hrs
3045 Gen (315 kW)	Ok	11	Open	Unavailable	0.00 kW	7913.07 kwh	62.6 hrs
3055 Gen (600 kW)	Ok	8	Open	Unavailable	0.00 kW	22843.53 kwh	52.7 hrs
3242 Gen (400 kW)	Ok	2	Open	Unavailable	0.00 kW	227.33 kwh	37.3 hrs


SOTF	COMM	PRIORITY	BREAKER	AVAILABILITY	OUTPUT	TOTAL KWH	RUNTIME
Gen 1 (? kW)	pending						
Gen 2 (? kW)	pending						
Gen 3 (? kW)	pending						

**Encorp DDE Status**

JSOC ●

SOTF ●

**LOAD MANAGER Schedule**



Powered by Niagara

Start <http://www.eiscentral.com...> WEB Pro Command Prompt Niagara Demo Page ... Document1 - Microsoft Word Document2 - Microsoft Word 1:15 PM



# EIS: Fuel Management M&V

www.eiscentral.com - Microsoft Internet Explorer provided by MSN

**Honeywell** M&V Reporting Edit ECSM

**PORTICO™** Honeywell T.E.A.M. Task Order M&V Reporting

Name: Gas Transportation ECSM Type: Gas

Description: Gas Transportation

Stipulated: ☐ Start Year: 2000

M & V Method: A Start Month: 3

Initial Investment: \$0 Allocation Type: N/A

January Month 2002 Year

(in DTherms)RFP	Nomination	Vendor Name	Actual	Actual \$
Strip 1		Select Provider		
Strip 2		Select Provider		
Strip 3		Select Provider		
Strip 4		Select Provider		

(in gallons) RFP	Nomination	Vendor Name	Actual	Actual \$
Fuel 1		Select Provider		

Zone Price	NCNG Rate 10	NCNG Rate T10
MEF Factor	Management Cost	G.A. (Global Adjustment)

Update Delete

## ***Overall ESPC Results***

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- Increased comfort
- 20 task orders awarded
- \$40M in infrastructure improvements
- Energy reductions > 196 GBTU's
- Emission reductions equal removal of 487 cars annually
- Saving Fort Bragg > \$7M a year in energy and operational costs

**Improved quality of life through infrastructure solutions that increase comfort and security and reduce overall costs**



## ***Critical Success Factors***

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- Executive sponsorship
- Comprehensive, long-term planning
- Focus on all savings
- Dynamic real-time management of information
- Information management greatly improves risk management



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